

### **REMARKS**

The non-final Office Action was issued on pending claims 1-9. Claims 1-9 stand rejected. In this Response, no claims have been amended, added or cancelled. Thus, claims 1-9 are pending in the application.

Applicants invite the Examiner to call Applicants' representative to discuss any issues regarding this patent application so that the application can be quickly placed in condition for allowance.

### **Examiner Interview**

Applicants thank the Examiner for the courtesy telephone interview with Applicants' Representative on August 26, 2003. During the interview, Applicants' representative discussed reasons why Applicants' invention is not obvious in view of the various references relied on in the Office Action. Applicants' representative particularly discussed that it would not be obvious to select the two electrodes 46, 48 shown in Fig. 7 of Shani and substitute the two electrodes for only a portion of the heater structure in Yamashita et al. As suggested by the Examiner during the interview, Applicants submit a reponse to the Office Action according to the interview discussion.

Applicants respectfully submit that the patent application is in condition for allowance.

### **Claim Rejections – 35 U.S.C. § 103**

In Office Action paragraphs 1-7, claims 1-4 and 6-8 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Chen et al. (US 5,757,995) in view of Kobayashi et al. ("Fluorinated Polyimide Waveguides with Low Polarization-Dependent Loss and their Applications to Thermo-optic Switches"), Yamashita et al. (JP 59-33430), Shani (US 6,259,834) and Kenney et al. (US 6,311,004). In Office Action paragraph 8, claim 5 was rejected under 35

U.S.C. § 103(a) as being unpatentable over Chen et al. in view of Kobayashi et al., Yamashita et al., Shani, and Kenny et al. as applied to claim 1, and further in view of Cohen et al. (US 5,418,868). In Office Action paragraph 9, claim 9 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Chen et al. in view of Kobayashi et al., Yamashita et al., Shani, and Kenny et al. as applied to claim 1, and further in view of Ooba et al. ("Low crosstalk and low loss 1x8 digital optical switch using silicone resin waveguides"). Applicants respectfully disagree.

Applicants' invention, as claimed in claim 1, calls for, among other elements, first and second branching section heaters at opposite sides of the branching section for heating different portions of the branching section and at least first and second branched core heaters for heating the plural branched cores, the first branching section heater and the first branched core heater being controlled separately and permitting individual heating conditions of the branching section and a selected branched core, the second branching section heater and the second branched core heater controlled separately and permitting individual heating conditions of the branching section and another selected branch core.

Without intending to limit the claims, Applicants refer to the example of the present invention shown in Fig. 1. An optical switch has first and second branching section heaters 11, 13 at opposite sides of the branching section 4b. The first and second branching section heaters 11, 13 heat different portions of the branching section 4b. First and second branched core heaters 12, 14 heat branched cores 5a, 5b. The branching section heater 11 and the branched core heater 12 are controlled separately and permit individual heating conditions of the branching section 4b and branched core 5a. The branching section heater 13 and the branched core heater 14 are controlled separately and permit individual heating conditions of the branching section 4b and the branched core 5b. See also, the specification at page 8, line 21 through page 9, line 9. In summary, Applicants' invention has two opposite branching section heaters which are controlled separately from two opposite branched core heaters.

Applicants respectfully submit that the references relied on in the Office Action do not disclose or suggest Applicants' invention, as claimed in claim 1. The Office Action now adds two new references (Chen et al. and Shani) to a long list of references combined to reject claim 1.

Chen et al. pertains to an optical coupler. Chen et al. shows and describes an optical coupler in the form of a Y-branch wave guide. As shown in Fig. 1 of Chen et al., a Y-branch wave guide assembly 10 has a main wave guide 12, a transition wave guide 15, and two branching wave guides 13 and 14. Light propagating through the main wave guide 12 passes through the transition wave guide 15 and branches into the two branching wave guides 13 and 14. The Office Action acknowledges that Chen et al. does not disclose altering a propagation path by selective heating of portions of the branching section (transition wave guide 15) and the two branched cores (branching wave guides 13 and 14). Indeed, Chen et al. does not appear to even mention heaters for the transition wave guide 15 or the two branching wave guides 13 and 14. Applicants respectfully inquire: where is the motivation to modify the optical coupler of Chen et al. to add heaters to the optical coupler, particularly two opposite branching section heaters which are controlled separately from two opposite branched core heaters?

The Office Action at page 3 asserts that it would be obvious to alter a propagation path by selective heating portions of the branch and cores of Kobayashi et al. with the device of Chen et al. since one would be motivated to do this in a switch for fast switching speeds as implied from Kobayashi et al. Applicants submit, however, that any implied switch having fast switching speeds in Kobayashi et al. does not provide a basis for modifying the optical coupler of Chen et al. to have heaters. For example, why would one be motivated to add the heaters of Kobayashi et al. to the optical coupler of Chen et al. when Chen et al. does not appear to be concerned about switching speeds for an optical coupler which propagates light to both branched cores?

The Office Action also relies on the newly cited reference Shani which pertains to a dense tree optical switch network. The Office Action asserts that Shani teaches first and second branching section heaters for heating plural branched cores (Fig. 7, #46 and 48). Shani describes Fig. 7 as a schematic diagram of a 1x2 splitter 26 having an input wave guide 36 which leads to a

coupling wave guide 38, which in turn leads to an output wave guide 42. The coupling wave guide 38 is close and parallel to another coupling wave guide 40, which leads into another output wave guide 44. The coupling wave guides 38 and 40 are covered by respective electrodes 46 and 48. Fig. 7 of Shani shows electrodes 46 and 48 only on the coupling wave guides 38, 40 and does not show electrodes or heaters on output wave guides 42, 44. The Office Action asserts at page 4 that it would have been obvious to have the first and second branching section heaters (presumably, electrodes 46 and 48) of Shani with the suggested device of the Chen et al. in view of Kobayashi et al. and Yamashita et al. since one would be motivated to use this to direct light in a certain direction as implied from Shani.

However, Yamashita et al. shows in Fig. 1 a single heater 6 for the branching area 3, a heater 7 provided on branch part 4 and a heater 8 on branch part 5. Applicants respectfully submit that it would not be obvious to select the asserted dual branching section heaters 46, 48 of Shani and substitute the dual heaters for only a portion of the heater structure of Yamashita et al. Shani does not provide or describe heaters for the output wave guides 42, 44. Accordingly, if the asserted heaters 46, 48 of Shani are substituted for the heaters of Yamashita et al., the resulting device would not have opposite heaters for the branched parts 4 and 5. Applicants respectfully inquire: where is the motivation for one to substitute the electrodes 46, 48 of Shani for only a portion of the heaters of Yamashita et al., particularly, the heater 6 for the branching area 3?

It is impermissible to arbitrarily select the features of Applicants' claimed invention from a variety of references and then use Applicants' invention as a guide to combine those arbitrarily selected elements. Rather, there must be a motivation, teaching, or suggestion to combine and modify the prior art references to result in Applicants' claimed invention. The teaching, motivation or suggestion must be identified with specificity in the prior art. *In re Lee*, 61 U.S.P.Q 2d 1430 (Fed. Cir. 2000).

As to Kobayashi et al., Kobayashi et al. shows in Fig. 9a a single heater 1 and a single heater 2. Heater 1 of Kobayashi et al. heats both the branching area  $P_0$  and port 1. Similarly, heater 2 heats both the branching area  $P_0$  and port 2. Nowhere does Kobayashi et al. disclose or suggest that heater 1 is a branching section heater and a branched core heater. Furthermore, Kobayashi et al. does not disclose or suggest a branching section heater and a branched core

heater which are controlled separately to permit individual heating conditions of the branching area  $P_0$  and the port 1. Similarly, Kobayashi et al. does not disclose or suggest that heater 2 is a branching section heater and a branched core heater are controlled separately to permit individual heating conditions of the branching area  $P_0$  and port 2. Furthermore, Kobayashi et al. does not provide a teaching, suggestion, or motivation to replace only a portion of heater 1 and a portion of heater 2 which heats the branching area  $P_0$  with two opposite heaters which are different heaters from the heaters which heat the port 1 and the port 2.

As to Kenney et al., Kenney et al. shows in Fig. 5 an active region 504 having heaters 506. Each heater 506 appears to heat both the branching area and its respective branched core. Kenney et al. does not disclose or suggest that each heater 506 is a branching section heater and a branched core heater controlled separately to permit individual heating conditions of the branching area and the selected branched core.

Furthermore, Kenney et al. does not provide a motivation, teaching, or suggestion to replace only a portion of each heater 506 such that each heater 506 is separated into two heaters, one heater that heats a branching area and another heater which heats a branched core. Furthermore, Kenney et al. does not provide a teaching, motivation, or suggestion to substitute a portion of each heater 506 with a separate heater such that individual heaters heat the branching section and the branched core, and separately control both heaters to permit individual heating conditions of the branching section and the branched core.

Therefore, Applicants submit that the references are not properly combinable to achieve Applicants' claimed invention. Furthermore, even, if the references are combined, the combination does not result in Applicants' claimed invention.

Thus, Applicants respectfully submit that the § 103 rejections have been overcome.

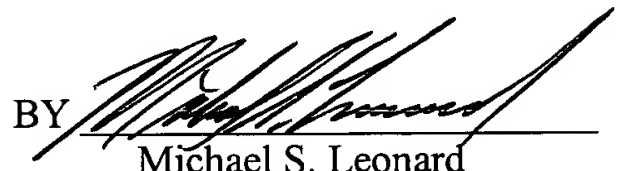
**CONCLUSION**

For the foregoing reasons, Applicants submit that the patent application is in condition for allowance and request a Notice of Allowance be issued.

Respectfully submitted,

BELL, BOYD & LLOYD LLC

BY

A handwritten signature in black ink, appearing to read "Michael S. Leonard", is written over a horizontal line.

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